U. S. Steel
Clairton Works
400 State Street
Clairton, PA 15025-1855

August 16, 1999

Dr. Roger Westman Ph D
Director Allegheny County Health Department
Department of Air Quality
301 Thirty-ninth Street
Pittsburgh, PA 15201

RE: Engineering Evaluation of the 19-20 Battery Pushing Emission Control System

Dear Dr. Westman,

In our meeting of June 18, 1999, USS Clairton Works committed to engaging an independent consultant to evaluate the operation, design, and general condition of the 19-20 Pushing Emission Control System. S/D Engineers, Inc. was selected to make the engineering evaluation. A draft copy of their report was reviewed by Clairton management. Action items from the report are listed below. The final report will be published shortly and is available for your review. The evaluation along with our other activities as discussed at the August 5, 1999 Quarterly Meeting affirms our commitment to environmental excellence.

The recommendations fall into 3 categories:

1. Recommendations made during the inspection, which have already been implemented.
    A. Hood car fresh air dampers (which temper the hot pushing emissions with cool ambient air) were not completely closing. This resulted in a loss of suction during the push. Repairs were made, more frequent inspections will be made in the future.
    B. Rubber seals between the hood car and the hood duct were deteriorated. These were replaced with a new design.
    C. Loose and deteriorated bolts and worn linkages on the fan inlet damper louvers were noted. These linkages have been repaired to improve airflow performance.
    D. The number 3 fan exhibited bearing problems. The bearings were replaced.
    E. Suction measurements revealed that it takes approximately 5 seconds for the ducts to come to full flow after the signal to initiate emissions collection. A three second delay has been placed on the pusher ram movement after the signal to initiate emissions collection. There is an additional 3 seconds of coke compression before the coke mass moves toward the coke guide. This result in a total 6-second delay to allow the PEC fans to achieve maximum flow.

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2. Recommendations for near-term improvements

A. Repair hood car stress cracks, and repair hood plate gaps, as required. Clips will be used where welding the plates proves unsatisfactory: Construction of the car uses dissimilar metals, carbon steel and stainless steel. Welding which is how the dissimilar metals are presently joined is not working out in this high heat stress environment. This repair will be instituted and completed over the next five weeks. The hood car will be set out and worked on for short periods in order to avoid a prolonged PEC outage.

B. Continue to investigate methods of reducing the incidence of belt misalignment. We have tried several belt roller designs, some were better than others, but none were completely satisfactory. The latest design, a tapered roller that has a high friction cover and larger capacity thrust bearings, is ordered and will be available for installation November 1999.

C. Realign and replace baghouse module cleaning blowpipes to improve bag-cleaning performance and extend bag life. This recommendation will be completed by August 31, 1999.

D. All five fan inlet dampers show general deterioration of the louvers and linkages. Five new dampers and actuators are ordered and will be available for installation in September.

E. Discontinue the practice of manually cleaning baghouse modules every day. The practice will be changed to clean them only when pressure drop measurement across the bags indicates the need. A small coating of material on the bag surface improves particulate removal. The pulsed air jet automatic cleaning leaves a small coating.

F. Modify the operation of the mass air cooler fresh air damper to a temperature control based system. This will increase the amount of time available for the normal automatic pulsed air cleaning.

G. Modify the baghouse cleaning cycle to allow the cleaning cycle to commence when the fresh air damper is open. This will also increase the amount of time available for the normal automatic pulsed air cleaning.

H. Modify the baghouse controller to use only 3 fans for the mass air cooler cooling cycle. This will also increase the amount of time available for bag cleaning. The implementation schedule for this and the 2 prior recommendations will depend on the extent of programming required and on. whether the existing PLC baghouse controllers will need to be replaced. These modifications will be evaluated by August 31, 1999. Preliminary engineering and an implementation schedule will be established by September 30, 1999.

3. Longer-term recommendations

Field measurements verified that the hood evacuation fans are currently performing as well as they did when initially installed. Consideration should be given to increasing the hood evacuation capacity by increasing the static head through installation of differently designed fans. Also, consideration should be given to evaluation of simultaneously operating all 5 of the upgraded fans. Motor current-control of the fan dampers may also be required to attain the maximum increase in

evacuation capacity. If technically feasible, this configuration has the potential of providing up to 30% more hood evacuation as compared to the present configuration. It will also be necessary to evaluate the air handling capacity of the PEC ductwork.

We will investigate the technical feasibility of and need for this modification. An order for engineering services to perform preliminary design of the proposed evacuation capacity upgrade will be placed by Sept. 7, 1999.

If you have any questions, please call me at 233-1467.

Sincerely,

W. C. Graeser
Manager Environment and Quality Assurance

CC: Sandra Etzel

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U. S. Steel
Clairton Works
400 State Street
Clairton, PA 15025-1855

October 13, 1999

Dr. Roger Westman Ph. D.
Air Quality Manager
Allegheny County Health Department
Bureau of Air Pollution Control
301 39th Street
Pittsburgh, PA 15201-1891

Re: Clairton Works -- Pushing and Travel - Batteries 19 and 20

Dear Dr. Westman,

The following is a monthly report of our efforts to reduce pushing and travel emissions on 19 and 20 Batteries, as promised from our meeting of June 8, 1999. It is our intention to bring these Batteries monthly composite pushing and travel performance too greater than 90% by October 1999 and a quarterly composite performance of greater than 94% by the first quarter of 2000. The composite performances are composed of pushing and travel observations made twice per day. The time of observation is set by random number generation.

Our efforts are split into two categories -- Battery Performance and Pushing Emission Control Performance. A plan of action for each of these categories was presented at the June 8th meeting. Several of the actions listed in each category were complete; indicating that we had already taken some steps to improve performance on 19 Battery and 20 Battery.

Additional items completed:

PEC SYSTEM

- Steam dampers were repaired by reconditioning the actuator system and replacing deteriorated sections of the damper. This provides for a tighter seal between the coke guide and car hood.

- New design belt rollers were installed. The roller crown pitch is enhanced with a 3/8" per 12" slope and a new rubber compound coating. So far the belt is training much straighter and therefore fitting tighter.

- Hood car stress cracks are repaired.

- Clearances between the buckstay and the door machine were made tighter.

- New fan damper louvers are installed. These will provide a smoother duct flow with less turbulence, which effectively increases evacuation volume.

These items complete the list of repairs and changes to the PEC System as proposed in the list presented at the June 8, 1999 meeting. Additional items are being addressed as they are found.

- An additional contract was placed with S/D Engineering. S/D Engineering Company will evaluate ways of increasing flow through modification of the fan tips and also assess other fan designs.

BATTERY SYSTEM

The activity on the battery system was concentrated on flue maintenance and identification of individual flue problems.

- A spreadsheet was developed to keep track of which flues need attention. The spreadsheet also maintains a history, so the flues with repeat problems can be identified and prioritized for repair. This system also expedites repair of flues with more severe problems. Flue repairs are expedited though the use of extra manpower. The spreadsheet is a management tool that allows us to make more effective use of our work force by directing repairs to specific flues rather than a general maintenance program.

- Rust was identified as a problem. Rust flakes originating in the steel riser pipes are depositing in the flue orifices. The reduction in orifice size reduces the combustion gas flow, which in turn yields under heated coke and the resultant pushing emissions. A commercial product "Rust Tech" is being evaluated to stop the flaking problem. Several sample riser pipes were painted with the Rust Tech. These riser pipes will be evaluated for effectiveness of the paint.

- Twelve ovens were identified on 19 Battery as candidates for panel patching. The ends of the identified ovens are no longer amenable to normal patching techniques. Patching material is falling into the flues resulting in restricted gas flow. In panel patching, the oven is taken out of service and new face brick is laid up in the problem

area. This repair will not only address cool coke, but will improve stack performance. We plan to panel patch an average of two ovens every month.

- In addition to effecting repairs, we have instituted a daily meeting between coal handling, coke oven operations, maintenance, and engineering. The purpose of the meeting is to address variability in coke oven heating and variability in coal charging. Both of these parameters have a large influence on consistent heating which in turn affects pushing emissions. A preliminary list of variables has been developed and is being worked on. In addition, PEC performance is discussed each day at this meeting.

- A prototype coke temperature profile system is being developed. Parts are being ordered to put the system in place. The prototype system will measure one temperature at the center of the coke mass as the coke is being pushed. Equipment needed for the system is a measuring device, process logic controller, radio transmission equipment and a personal computer. This system will provide a direct measurement of coke temperature rather than the indirect measurements presently being used; namely flue temperatures and cross wall temperature profiles.

The attached data sheets show pushing and travel compliance for September, also attached is a list of the random observation times. We are committed to achieving a quarterly composite performance of 94% and believe that improved operating and maintenance practices will get us there by first quarter 2000.

Sincerely,

W. C. Graeser
Manager Environmental and
Quality Assurance

Sheet1

Frank/Terry

Please use the times and dates listed below for observations of 19 and 20 Battery pushing and travel. The observer is to try to start the observation within plus or minus 30 minutes of the listed time. If the observation cannot be started within the time frame, record a reason on the report sheet. Regardless, two observations per battery per day must be made. Times are military time.

Bill Graeser
9/15/99

9/15/99	845	1200
9/16/99	845	930
9/17/99	1400	1400
9/18/99	1830	1830
9/19/99	1045	1400
9/20/99	745	1845
9/21/99	830	1730
9/22/99	1130	1330
9/23/99	830	1300
9/24/99	1400	1600
9/25/99	1000	1115
9/26/99	1300	1530
9/27/99	1345	1630
9/28/99	1145	1245
9/29/99	1430	1530
9/30/99	1045	1315
10/1/99	1530	1830
10/2/99	1900	1900
10/3/99	715	930
10/4/99	915	1200
10/5/99	1700	1715
10/6/99	1330	1745
10/7/99	1215	1630
10/8/99	1045	1130
10/9/99	700	1545
10/10/99	700	1500
10/11/99	1130	1830
10/12/99	1100	1615
10/13/99	1000	1515
10/14/99	1545	1615

Terry,Frank

Please find the new list of random observations for use in observing 19-20 Battery. The time is in military units. The observation window is plus or minus a half hour.

Thanks Bil Graeser
8/16/99

~~17-Aug~~	~~1200~~	~~1800~~
~~18-Aug~~	~~900~~	~~1500~~
19-Aug	900	1900
20-Aug	1400	1900
21-Aug	700	1200
22-Aug	1200	1600
23-Aug	1900	1900
24-Aug	1200	1600
25-Aug	900	900
26-Aug	1400	1500
27-Aug	1200	1900
28-Aug	800	1700
29-Aug	1200	1500
30-Aug	1100	1900
31-Aug	1500	1900
1-Sep	1100	1300
2-Sep	1200	1200
3-Sep	1400	1800
4-Sep	700	1200
5-Sep	800	1600
6-Sep	800	1800
7-Sep	1300	1900
8-Sep	1400	1500
9-Sep	700	900
10-Sep	1500	1800
11-Sep	1300	1500
12-Sep	700	1800
13-Sep	1900	1900
14-Sep	1000	1400
15-Sep	800	1500

} use old schedule

Battery 19

Date	Time	Oven	Push Sec.>=20%	Push Max Opac.	Travel Sec.>10%	Travel Max Opac	Push Perfor	Travel Perfor	Combined Performance
9/1/99	11:08	C06	0	5%	0	0	1	1	1
	13:49	A07	22	85%	13	55%	0	0	0
9/2/99	12:10	B08	0	5%	0	10%	1	1	1
	12:21	B08	0	15%	0	10%	1	1	1
9/3/99	13:43	A08	0	0%	0	5%	1	1	1
	17:52	B17	0	5%	0	5%	1	1	1
9/4/99	7:15	C19	0	5%	0	5%	1	1	1
	11:48	B11	23	100%	11	40%	0	0	0
9/5/99	8:06	B13	21	55%	11	40%	0	0	0
	15:48	A27	0	0%	0	0%	1	1	1
9/6/99	7:38	C26	0	5%	0	0%	1	1	1
	18:03	A08	9	50%	0	5%	0	1	0.6
9/7/99	13:05	A09	0	5%	0	5%	1	1	1
	18:44	C02	12	30%	25	25%	0	0	0
9/8/99	3:05	C10	0	5%	0	10%	1	1	1
	4:13	C22	0	5%	0	5%	1	1	1
9/9/99	7:22	B11	32	60%	22	30%	0	0	0
	8:40	B23	0	5%	0	5%	1	1	1
9/10/99	16:12	C09	14	60%	15	30%	0	0	0
	17:42	A08	0	10%	0	5%	1	1	1
9/11/99	13:10	A10	0	5%	0	10%	1	1	1
	15:24	A28	0	10%	0	10%	1	1	1
9/12/99	7:33	C25	0	5%	0	0%	1	1	1
	19:04	A15	12	50%	18	80%	0	0	0
9/13/99	18:41	C05	0	5%	0	0%	1	1	1
	18:52	C27	0	10%	22	25%	1	0	0.5
9/14/99	8:58	A27	0	15%	0	10%	1	1	1
	13:47	C05	0	0%	0	0%	1	1	1
9/15/99	B24	8:10	0	10%	0	5%	1	1	1
	B11	15:58	0	0%	0	0%	1	1	1
9/16/99	A32	8:58	0	5%	0	10%	1	1	1
	A24	9:11	0	0%	0	0%	1	1	1
9/17/99	A25	13:35	0	0%	0	5%	1	1	1
	A27	15:48	0	10%	0	5%	1	1	1
9/18/99	18:18	A28	0	15%	0	10%	1	1	1
	18:29	C27	3	60%	29	40%	0	0	0
9/19/99	11:00	A4	0	10%	0	10%	1	1	1
	13:34	B1	7	100%	0	10%	0	1	0.5
9/20/99	7:26	A12	0	5%	0	5%	1	1	1
	18:32	A29	0	15%	0	10%	1	1	1
9/21/99	9:04	C02	0	5%	0	5%	1	1	1
	17:18	B24	0	5%	0	0%	1	1	1
9/22/99	11:31	B08	8	35%	0	0%	0	1	0.5
	13:43	B28	0	0%	0	0%	1	1	1
9/23/99	9:45	B20	0	0%	0	5%	1	1	1
	12:55	A02	0	0%	0	5%	1	1	1
9/24/99	14:00	C04	0	5%	0	5%	1	1	1
	16:04	C29	0	0%	0	0%	1	1	1
9/25/99	10:17	C14	0	15%	0	10%	1	1	1
	11:27	C24	0	15%	0	0%	1	1	1
9/26/99	12:53	B26	0	5%	0	5%	1	1	1
	15:28	C15	0	5%	0	5%	1	1	1
9/27/99	14:02	A24	0	0%	0	10%	1	1	1
	18:28	B15	0	0%	0	0%	1	1	1
9/28/99									
9/29/99	14:12	A29	5	55%	23	35%	0	0	0
	15:45	B08	0	15%	0	10%	1	1	1
9/30/99	13:55	C09	0	10%	0	10%	1	1	1
	14:06	C11	0	5%	0	5%	1	1	1
Total		58	168		189				
Average			2.90		3.26		79.31%	82.76%	81.03%

Battery 20

Date	Time	Oven	Push Sec.>=20%	Push Max Opac.	Travel Sec.>10%	Travel Mac Opac.	Push Perfor	Travel Perfor	Combined Performance
9/1/99	11:02	C04	0	0%	0	0%	1	1	1
	13:45	A05	0	10%	0	5%	1	1	1
9/2/99	12:05	B04	0	5%	0	5%	1	1	1
	12:15	B06	0	5%	0	5%	1	1	1
9/3/99	13:49	A08	0	0%	0	5%	1	1	1
	17:46	B15	0	0%	0	0%	1	1	1
9/4/99	7:05	C17	0	10%	27	100%	1	0	0.5
	11:53	B11	0	15%	10	30%	1	0	0.5
9/5/99	8:00	B11	0	0%	0	0%	1	1	1
	15:53	A27	0	15%	0	5%	1	1	1
9/6/99	7:44	C28	0	5%	0	0%	1	1	1
	17:58	A06	0	0%	0	0%	1	1	1
9/7/99	13:11	A08	0	15%	0	5%	1	1	1
	18:38	B29	0	5%	0	0%	1	1	1
9/8/99	3:11	C10	0	5%	0	5%	1	1	1
	4:19	C22	0	5%	0	0%	1	1	1
9/9/99	7:28	B11	33	70%	10	25%	0	0	0
	8:46	B23	0	10%	0	10%	1	1	1
9/10/99	15:06	C07	0	5%	0	10%	1	1	1
	17:47	A08	10	50%	14	30%	0	0	0
9/11/99	13:15	A10	0	10%	0	10%	1	1	1
	15:29	A28	6	45%	0	10%	0	1	0.5
9/12/99	7:33	C25	0	5%	0	0%	1	1	1
	18:10	A11	0	10%	12	30%	1	0	0.5
9/13/99	19:35	C03	0	10%	0	10%	1	1	1
	18:46	C05	0	5%	0	0%	1	1	1
9/14/99	9:52	A23	0	5%	0	5%	1	1	1
	13:55	C05	0	5%	0	5%	1	1	1
9/15/99	8:16	B24	0	5%	0	0%	1	1	1
	15:52	B09	0	0%	0	0%	1	1	1
9/16/99	8:52	A20	0	5%	0	0%	1	1	1
	9:05	A22	27	60%	45	35%	0	0	0
9/17/99	13:41	A25	0	15%	0	10%	1	1	1
	13:54	A27	0	15%	0	10%	1	1	1
9/18/99	18:23	A24	0	10%	0	5%	1	1	1
	18:36	A26	0	15%	0	10%	1	1	1
9/19/99	10:52	C29	0	10%	0	10%	1	1	1
	13:40	B1	0	5%	0	10%	1	1	1
9/20/99	7:31	A12	0	5%	0	0%	1	1	1
	18:38	A29	0	5%	0	5%	1	1	1
9/21/99	8:55	B29	0	0%	0	5%	1	1	1
	17:24	B24	0	5%	0	0%	1	1	1
9/22/99	11:40	B08	0	10%	0	0%	1	1	1
	13:35	B26	0	0%	0	0%	1	1	1
9/23/99	8:39	B18	0	0%	0	5%	1	1	1
	12:47	C29	0	5%	0	5%	1	1	1
9/24/99	13:54	C02	0	5%	0	5%	1	1	1
	15:58	C18	0	5%	0	0%	1	1	1
9/25/99	10:20	C12	6	90%	26	40%	0	0	0
	11:22	C27	0	10%	0	10%	1	1	1
9/26/99	12:48	B24	0	5%	0	10%	1	1	1
	15:33	C17	0	10%	0	10%	1	1	1
9/27/99	13:56	A22	0	10%	0	10%	1	1	1
	16:33	B15	0	0%	0	0%	1	1	1
9/28/99	No Pushing Daylight Hours With Hood Operations								
9/29/99	14:07	A27	10	40%	0	10%	0	1	0.5
	15:39	B6	0	10%	0	10%	1	1	1
9/30/99	14:00	C09	0	5%	0	5%	1	1	1
	14:12	C11	0	10%	0	10%	1	1	1
Total		56	92		144				
Average			1.59		2.48		89.66%	87.93%	88.79%